Set Name side by side	Query	Hit Count	Set Name result set
	DB=USPT,PGPB,JPAB,EPAB,DWPI,TDBD; PLUR=YES; OP=ADJ		
L7	polyetheramide block copolymer and polypropylene glycol and composit$5	1	L7
L6	polyetheramide block copolymer and polypropylene glycol and composit$5 [ti]	0	L6
L5	polyetheramide block copolymer and glycol and composit$5 [ti]	6	L5
L4	polyetheramide block copolymer and glycol and composit$5	12	L4
L3	polyetheramide block copolymer and glycol	15	L3
L2	polyetheramide block copolymer	53	L2
L1	Daiamide PAE	0	L1

END OF SEARCH HISTORY

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L7: Entry 1 of 1 File: USPT Sep 11, 1990

DOCUMENT-IDENTIFIER: US 4956423 A
TITLE: Hot-melt adhesives

Abstract Text (2):
wherein PA represents a polyamide segment and PE represents a polyether segment, m is an integer ranging from 5 to about 100, Y is a group selected from ##STR2## The compositions of the invention can further include polyphenol compositions and pigments. The compositions are useful as hot melt adhesives or sealants. They retain their useful properties at very low temperatures, as low as -40.degree. C.

Brief Summary Text (2):
Various adhesive compositions have been used to adhere substrates. Compositions used in the art include water-borne adhesives, solvent borne adhesives and hot melt adhesives. Hot melt adhesives are advantageous because they are non-polluting as compared to solvent based systems, and do not require evaporation of water as in water based systems. Hot melt adhesives, based on thermoplastics have proven useful in assembly line applications where speed is essential, but the known systems have proven to have disadvantages.

Brief Summary Text (4):
Polyetheramide block copolymers with useful application temperatures (-40.degree. C. to 150.degree. C.) usually have very high melt viscosities (.apprxeq.9,000 poise at 200.degree. C.) and are not applicable as hot melt adhesives due to the limitations of the capacity of hot melt dispensing systems. Commercial hot melt dispensing systems generally cannot handle materials having viscosities greater than 1000 to 2000 poises. Hot melt adhesives with dispersing temperatures higher than 200.degree. C. are not suitable to bind many thermoplastic substrates, such as polycarbonate, and the like. Thus, the foregoing polyetheramides are not known as adhesives.

Brief Summary Text (6):
Other attempts at utilizing the polyetheramides in hot melt compositions appear in French Patent No. 2,533,577, which discloses a complex mixture of components including a polyetheramide, but also including butyl rubber, a terpene-phenolic resin, an ethylene vinyl acetate copolymer, a polyisobutylene and polypropylene. There is no disclosure or suggestion to use a polyamide in the mixture. Similarly, French Patent No. 2,523,143 discloses a mixture of a polyetheramide with a vinyl ester polymer, but does not suggest the use of a polyamide.

Brief Summary Text (10):
The improved hot melt adhesives of the invention comprise a blend of a polyamide and a polyetheramide, also referred to as a polyetheramide block copolymer and a polyether block amide.

Brief Summary Text (14):
The compositions of the invention can further include polyphenol compositions and pigments.

Brief Summary Text (15):
The compositions are useful as hot melt adhesives or sealants. They retain their useful properties at very low temperatures, as low as -40.degree. C.

Brief Summary Text (20):
Optionally, a saturated aliphatic hydrocarbon dicarboxylic acid of the formula ##STR7## can be included in the composition. D can be a saturated, preferably linear, aliphatic

hydrocarbon radical of 1 to about 12 carbon atoms or an aryl radical such as a phenyl radical. Suitable acids of this type include ethanedoic acid, hexanedoic acid, nonanedoic acid, decanedoic acid and isophthalic or terephthalic acid.

Brief Summary Text (27):
wherein n' is an integer from 1 to 10, preferably no more than 5, and m' is an integer from 5 to about 1,000, preferably up to about 200. The molecular weight of the polyether segment is generally in the range of about 400 to 5000 to provide a low glass transition point of less than -20.degree. C. Suitable polyethers are the polyalkylene glycols, also known as polyoxyalkylene glycols, such as, polyethylene glycol, polypropylene glycol, polytetramethylene glycol, and hydroxyl terminated poly(tetrahydrofuran).

Detailed Description Text (4):
Polymer B was a polyetheramide block copolymer sold under the tradename PEBAX 2533 by Atochimie, which comprised about 50% of the polyether segment (PE). The block polymer had a melting temperature of about 148.degree. C. as measured according to ASTM D789 method. The polymer had a melt viscosity of 16,000 poise at 200.degree. C. and 1 second.sup.-1 shear rate as measured by capillary viscometer.

Detailed Description Text (8):
The data in Table 1 show that the blend of the invention has a melt viscosity that makes it very useful for application as a hot melt adhesive in commercially available equipment. By contrast, the melt viscosity of polymer B is so high that it would be very difficult to process in commercially available equipment. Referring to the adhesion data, polymer A had adhesion strengths of 100 to 300 lbs/square inch and Polymer B had adhesion strengths of 220 and 330. But what is significant is that the bonds using polymers A and B broke by adhesive failure, in which the bond between the adhesive and substrate fails. By comparison, the bonds made with the composition of the invention failed by "cohesive failure", in which the break occurs in the body of the adhesive. The latter mode of failure is preferred in commercial practice because it is deemed to be a more reliable or predictable form of failure.

Detailed Description Text (9):
Further in Table 1, the composition of the invention was found to be vastly superior to polymer B with respect to oil resistance as measured as a function of dimensional change, and with respect to Polymer A when tensile strength and retention of strength were determined. Thus, the blend of the invention exhibited a synergistic improvement in oil resistance.

Detailed Description Text (13):
To the polymer blend of Example 1 were added carbon black and a polyphenol sold by Ciba-Geigy under the trade name IRGANOX 1010, which has the following formula ##STR10## The proportions of the polymers and additives are shown in Table 3. The compositions were compounded using a twin screw extruder which had barrel zone temperatures of 145.degree. C. (zone 1), 140.degree. C. (zone 2), 125.degree. C. (zone 3), 115.degree. C. (zone 4), 115.degree. C. (zone 5) and 115.degree. C. (die) at 120 revolutions per minute. The oil resistance in terms of the percent dimensional increment was determined for each of the compositions, including control blend III. The results are shown in Table 3.

CLAIMS:

1. A hot melt adhesive composition comprising a blend of a polyamide and a polyetheramide,

wherein the polyamide has the formula ##STR11## wherein A is a linear, branched or cyclic aliphatic hydrocarbon radical and B is a branched, saturated or unsaturated, aliphatic hydrocarbon radical, and x is 5 to about 500;and

wherein the polyetheramide has the formula

PA--Y--PE).sub.m

wherein PA represents a non-branched polyamide segment and PE represents polyether segment, m is an integer in the range from 5 to about 100, Y is a group selected from ##STR12##

2. The composition of claim 1 comprising about 20 to 80 parts by weight of polyamide

per 100 parts by weight of the polyamide and the polyetheramide.

3. The composition of claim 1 comprising about 40 to 60 parts by weight of polyamide per 100 parts by weight of the polyamide and the polyetheramide.

4. The composition of claim 1 wherein B is a branched, unsaturated, aliphatic hydrocarbon radical having a chain length of about 16 to about 40 carbon atoms.

5. The composition of claim 4 wherein A is a linear aliphatic hydrocarbon radical having a chain length of about 2 to about 20 carbon atoms.

6. The composition of claim 5 which also contains residues of a saturated aliphatic hydrocarbon dicarboxylic acid.

7. The composition of claim 1 wherein the polyether segment has the formula

(--CH.sub.2).sub.n' O .sub.m'

wherein n' is an integer from 1 to 10, and m' is an integer from 5 to about 1000.

8. The composition of claim 7 wherein the polyamide segment is produced by ring opening a lactam compound.

9. The composition of claim 1 also comprising a pigment.

10. The composition of claim 1 wherein the polyamide is the reaction product of components comprising

a dicarboxylic acid having the formula HOOCBCOOH wherein B is a branched, saturated or unsaturated aliphatic hydrocarbon radical of about 16 to about 40 carbon atoms, and

a diamine having the formula H.sub.2 N A NH.sub.2 wherein A is a linear, branched or cyclic aliphatic hydrocarbon radical having 2 to about 20 carbon atoms.

11. The composition of claim 10 which also contains a dicarboxylic acid having the formula HOOC D COOH wherein D is a saturated aliphatic hydrocarbon radical of 1 to about 12 carbon atoms, or an aryl radical.

12. The composition of claim 1 wherein the polyetheramide is the reaction product of a polyether and a non-branched polyamide, said polyetheramide having a number average molecular weight greater than 10,000.

13. The composition of claim 15 wherein the polyether contains the structure

(--CH.sub.2).sub.n' O.sub.m '

wherein n' is an integer from 1 to 5 and m' is an integer from 5 to about 200.

14. The composition of claim 13 wherein the polyamide is formed by catalytically opening a lactam compound.

15. A hot melt adhesive composition comprising a polyamide of the formula ##STR13## wherein A is a linear, branched or cyclic aliphatic hydrocarbon radical and B is a branched, saturated or unsaturated, aliphatic hydrocarbon radical, and x is 5 to about 500 and a polyetheramide having the formula

PA--Y--PE.sub.m

wherein PA represents a non-branched polyamide segment and PE represents a polyether segment, m is an integer in the range from 10 to about 50, Y is a group selected from ##STR14## the polyamide is present in a proportion of about 20 to 80 parts by weight based on 100 parts by weight of the polyamide and the polyetheramide.